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ABSTRACT

Partnership 2000 is a joint collaborative effort of labor, education, and industry in California created to address the needs of employees through vocational and technical education provided by community colleges and affiliated training institutions. Partnership 2000's long-range goals are to: (1) improve student access to vocational education programs; (2) promote private sector and community college participation and coordination; (3) increase student job placement or further educational opportunities; (4) develop faculty renewal and recency programs with industry; (5) revise vocational education curricula to incorporate new technology; (6) orient faculty to the use of high technology to teach and train students; (7) stimulate discussions to focus on vocational education issues from global and national perspectives. Part I of this report describes Partnership 2000, its formation, and goals. Part II highlights some exemplary partnerships formed through the program, including partnerships between community colleges and public utilities; a project involving the Los Angeles Community College District, the Los Angeles Unified School District, and the Industry Education Council of California in planning 2+2+2 curricula in the areas of aeronautics, fashion merchandising, and manufacturing; a high technology demonstration project; and a health care issues forum. Part III describes the Partnership 2000 process, highlighting the formation of ED>NET. Part IV relates experiences with exemplary aviation partnerships, while part V summarizes 1993-93 Partnership 2000 activities, including forums, and faculty and student internships. Finally, part VI offers comments on the future of Partnership 2000. Extensive appendixes contain more detailed information on the aviation partnerships. (KP)

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A BRIDGE TO A MORE EFFECTIVE CALIFORNIA WORKFORCE

Partnership 2000

Jack Fujimoto, Ph.D., Director

ED 375 865

MONOGRAPH

PARTNERSHIP 2000

IMPROVING THE WORKFORCE THROUGH PARTNERSHIPS

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PARTNERSHIP 2000

IMPROVING THE WORKFORCE THROUGH PARTNERSHIPS

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PREFACE

This monograph is written to capture the experience of several innovative individuals who came together to share a common vision that resulted in a common bond. Some stayed through the many experiences of PARTNERSHIP 2000 while others came and went as the time and topic shifted or their job changed. In some instances, the partnership activities were spun off from the main core and became a separate partnership activity. In other instances, another activity became blended into PARTNERSHIP 2000. It is the task of this writer to capture that dynamic innovative experience that became the forerunner of much of today's economic development in California...IMPROVING THE WORKFORCE THROUGH PARTNERSHIPS.

The keystone of the partnerships initially centered in the aviation training arenas. Later, this branched out to other areas of interest; however, aviation continued to be the arena where much of the innovation for improving the workforce remained.

There are many to whom this writer owes a debt of gratitude for their volunteer efforts in making partnerships operative and successful. The Project Director often relied upon the Project Monitor stationed in Sacramento for guidance and support. Dan Estrada was always readily available and helpful. He was the key to keeping the project from becoming fragmented or even being eliminated only because he believed so much in the partnership concept and outcomes.

I also express gratitude to my wife, Grace Fusaye Fujimoto, for her understanding of our partnership which, in a way, was not dissimilar to partnership concepts in PARTNERSHIP 2000. There were many hours and days that I devoted and donated to PARTNERSHIP 2000, which, in essence, could have been spent at home to spruce up the aging house or even, spent at the College to planning and dreaming of its much needed expansion.

It is to many individuals who sacrificed their volunteer time and effort that I dedicate this monograph. Without their willingness to move freely without any salary or wage, just as it was for this Project Director, there would be less worth to this writing.

As in any report, I take full responsibility for the shortcomings of this monograph or any errors in accuracy.

In the coming months or years, there will be others who had participated in the PARTNERSHIP 2000 experience who will be writing their own memoirs of these dynamic years of working together. It is the hope of this writer that this monograph is the impetus of such writings.

Personally, it has been gratifying to learn more about life's lessons, that they are truly partnerships. Often, these are extended partnerships in the nature of networks where considerable collaboration exists among groups of interested individuals. We learn about what we are due to the many and hopefully, varied, experiences. Who was it that said that we cannot change our past but can only learn from it? We all have the ability to change and can thereby effect change in others. PARTNERSHIP 2000 has been this type of growth experience.

August 15, 1994 Jack Fujimoto, Ph.D.

PARTNERSHIP 2000

IMPROVING THE WORKFORCE THROUGH PARTNERSHIPS

PART I A HISTORICAL PERSPECTIVE

I. THE COLLAPSE OF FOUR SILOS - THE START OF A PARTNERSHIP

Benson Munger, world roving consultant for State Senator Bill Greene and card carrying member of the Printers Union, gave a stimulating talk to the Board of Directors of PARTNERSHIP 2000 about the correctness of our vision to create partnerships through the collapse of four silos. The silos represent the areas of **business and industry, the government, organized labor, and the education community with emphasis on community colleges.** Basically, it was Ben's contention that government was going its way without consulting the education community or others as it passed legislation. Ben believed strongly in the community colleges as the nexus for training a world class workforce.

What PARTNERSHIP 2000 represented was a group of individuals from several walks of professions and trades. Among members of the Board of Directors in 1986 were

David Sickler, Regional Organizer, Western Region, AFL-CIO
Gene Antone, Vice Chancellor, California State University System
Dan Estrada, Project Monitor, California Community Colleges
Don Clausen, Former Congressman, District 1, California
Vito Ciarfaglio, Counselor, City College of San Francisco
Chad Woo, Jr., Administrator, Los Angeles City College
Gene Little, Chairman, Aviation Department, San Jose State University
Ray Goldsby, Director of Maintenance Operations, United Airlines

Each person on the Board brought to it some unique characteristics and experiences. The "chemistry" was healthy.

Since the members of the Board came from different settings and backgrounds, the definition of partnership became a contentious issue for a year or more. Arguments erupted often about whether vocational education was the same as technical education or whether education and training were the seeds for partnerships. At times, the definition emanated from one's background and experiences which were not "bought" by others. A "buy-in" with consensus was necessary in all activities undertaken through PARTNERSHIP 2000.

II. DEFINITION OF PARTNERSHIP

The definition of partnership used by PARTNERSHIP 2000 is as follows:

A PARTNERSHIP is any written or verbal understanding agreed upon by two or more constituencies including governmental agencies, educational institutions, community based organizations, and the private sector (business, industry and labor). This understanding or agreement focuses upon all parties involved utilizing a specifically identified amount of human, material and economic resources to improve the services and/or products that are mutually beneficial to partnerships. Any partnership is subject to periodic review as agreed by the parties.

III. WHAT IS PARTNERSHIP 2000?

PARTNERSHIP 2000 is a joint collaborative effort among entities in California to address the needs of employees through vocational and technical education provided by community colleges and affiliated training institutions.

PARTNERSHIP 2000 established long range goals to do the following:

a. Improve student access to vocational education programs
b. Involve private sector participation and coordination

with community college programs

c. Increase student placement to jobs or further educational opportunities
d. Develop faculty renewal and recency programs with industry
e. Revise vocational education curricula to incorporate new technology
f. Orient faculty to the use of high technology to teach and train students
g. Stimulate discussions to focus on vocational education issues from a global and national perspective.

PART II SOME EXEMPLARY PARTNERSHIPS

I. PUBLIC UTILITIES

In 1986, Dan Estrada worked a relationship between the Chancellor's Office, California Community Colleges, with officers from Pacific Gas and Electric (PG&E) in San Francisco. Community college faculty from several Northern California schools were invited to join PG&E staff in their training activities at their Stockton facility. The partnership between industry and education provided outstanding opportunities for teacher upgrade of their knowledge base as well as creating an environment for collaborative relationships.

In addition to initiating the faculty internship program, PG&E provided substantial summer internship opportunities to community college students. The interns were paid a stipend which added funds to further their education.

In addition, PG&E subsidized a newsletter featuring educational issues that emphasized the community college and industry partnership arrangement.

Further efforts to expand the PG&E experience to other

utilities in California, such as to the Department of Water and Power in the City of Los Angeles (DWP) and Southern California Edison (SCE) were more fragmented thrusts rather than partnership arrangements. PARTNERSHIP 2000 approached both utilities at a later date to establish faculty internships; however, at best, a workshop was sponsored for faculty lasting three to four days on two separate occasions through SCE. Also, faculty tours of five days duration were arranged through DWP in conjunction with the CSUC system.

SCE eventually arranged several scholarships for community college students, but, basically, did much of its work with the Industry Education Council of California (IECC).

This experience validated the concept of internships being valuable to community college faculty and students in gas, water, electricity industries and the environmental sciences.

II. AERONAUTICS (AVIATION MAINTENANCE & AVIONICS)

At San Jose State University, in 1986, a group of aviation-oriented individuals assembled in its Department of Aviation to discuss the formation of a partnership. Dr. Gene Little, Department Chair, talked of "thyroidals" and "hemmorhoidals," which referred to those who wanted action and those who preferred to sit around and "chew the fat." Dr. Gene Antone of CSU, Benson Munger, Don Clausen, Dan Estrada, Ray Goldsby, and this writer talked about being "thyroidals" and therefore, crafted plans for an emerging partnership that employed a process to make a partnership come alive in aviation maintenance and avionics programs.

Basically, the process reviewed the "teaching-learning" process or "the two ends of the log" approach, the log representing the aviation curricula. On one end was the student looking for effective ways of learning and on the other end, was the teacher looking for effective teaching methods and strategies.

Vito Ciarfaglio, City College of San Francisco, took a sabbatical leave and canvassed the 18 community colleges with aviation maintenance, avionics (aviation electronics), or aviation operations programs to learn the extent to which faculty and students were involved in upgrading their teaching, curriculum, and learning. He quickly acknowledged that the knowledge base was outdated in some faculty, that program articulaton based on Federal Aviation Administration standards was needed in general, and student learning was generally based on obsolete, yet, expensive equipment.

These events, plus other factors, led PARTNERSHIP 2000 to focus its energies in this sector of aeronautics activities. Since considerable work was done in the years from 1986 to the present in the aeronautics arena, there will be more discussion later.

III. A NEW SCIENCE: CORPORATE ANTHROPOLOGY

Wellford "Buzz" Wilms, Professor in UCLA's Graduate School of Education, met Benson Munger and was led on a journey that has resulted in methods used in anthropology being applied to the corporate world. The premise, as best as I understood it, was that

the American workforce was becoming obsolete and therefore, it could not compete well with the world's emerging technology-oriented workforce. So, Buzz and his academic cadre (basically working on their doctoral dissertations) applied the scientific and scholarly approach to study the corporate cultures in four special situations in business and industry.

A study was initiated at NUMMI, USS-Pasco, Hewlett-Packard and McDonnell-Douglas to identify factors critical to changing the worker and work environment. These were reported in a 1992 California statewide seminar on the "Factory of the Future".

What emerged from these studies was what I call a new science of corporate or industrial anthropology, i.e., how does a corporation or industry change in order to meet its competition, or what elements are critical for change to occur?

This new science was being fueled by the many studies being made of education in other nations of the world. The Deming Award and the Deming principles gave Japan an upper hand in crafting quality products. There was considerable internal questioning in the United States of developing a competitive global workforce. The United States was facing serious balance of trade and payments issues. There was the push for common markets in Europe, Asia, and North America which only fueled the industrialists to stress quality through development of a quality workforce. The significance of the Wilms's study is based on his acknowledging the value of partnerships within the successful corporation.

IV. THE LOS ANGELES PARTNERSHIP

In Project 87-0120, the Los Angeles Community College District (LACCD) was funded from the State Chancellor's Office of the California Community Colleges (COCCC) for a joint partnership with the Los Angeles Unified School District (LAUSD) and the Industry Education Council of California (IECC) to plan an "upside down" curriculum in the areas of aeronautics, fashion merchandising, and manufacturing technology. In 1988, the principal investigators in these areas of study identified schools offering these programs and linked them so that the resultant was a "2+2+2" career ladder of progression.

In the aeronautics arena, Alvin Gorenbein assumed the role of principal investigator. He visited several high schools and occupation centers and based on his studies, linked them to Martin Wolf at West Los Angeles College, who headed its aviation maintenance and avionics programs. He then met with Dr. Gene Little of San Jose State University to articulate the West Los Angeles College program for student transfer into the State University baccalaureate degree program.

In the fashion merchandising arena, Pat Wilson assumed the role of principal investigator. She visited the several LAUSD schools that had relations with Sharon Tate's program at Los Angeles Trade-Technical College. The credits generated at Trade-Technical College became transferable to California State University at Los Angeles (CSULA) through their leader, Don Marizio. The CSULA graduate was recognized for the "majors" courses taken at Trade-Technical College and took additional liberal

studies courses at CSULA, eventually resulting in a baccalaureate.

In the manufacturing technology sector, Don Brunet and Ann Gee were principal investigators. They essentially worked with the occupational centers of LAUSD and linked them to Trade-Technical College's manufacturing technology program through Peter Radekus, Raj Ramani, and Phil Padilla. These were being designed to bridge to the University of Southern California and its Institute of Manufacturing Automation Research (IMAR) under the direction of Dr. Dale Hartman.

Essential to the curricular development in each of the above "upside down" curricula was the industry advisement component, i.e., the curriculum was to be driven by industry's leaders.

The findings from this project eventually led to the formation of "WORKFORCE LOS ANGELES" and more recently, into the formation of "WORKFORCE CALIFORNIA" which are industry-driven projects. The directors for these two projects were members of the original LOS ANGELES PARTNERSHIP Project. They were Dr. Xavier del Buono and Joe Richey.

The Director of the LOS ANGELES PARTNERSHIP was this writer who, at the time, was Vice Chancellor of Educational Services for LACCD. Much support was provided by Jim Figueroa, LAUSD Assistant Superintendent for Adult Programs.

V. ENERGY, ENVIRONMENT, AND UTILITIES TRAINING

In 1990, several utilities including Southern California Edison, San Diego Gas and Electric, Pacific Gas and Electric, Metropolitan Water District, Southern California Gas and the Los

Angeles Department of Water and Power, looked to PARTNERSHIP 2000 for energy training programs. "Energy doctors" to inspect and reduce energy in institutions was a concept that was explored with the California Department of Energy and the Federal Department of Energy representatives visiting California. Los Angeles Mission College was the venue of such a concept developing forum.

In another venue, "energy technicians" such as "meter readers" was a concept explored with Southern California Edison.

Unfortunately, PARTNERSHIP 2000 was discouraged from developing curricula for the training of qualified personnel to study and conserve energy, and therefore, abandoned plans and focused on aviation-related activities.

VI. MANUFACTURING TECHONOLOGY TRAINING

On April 19, 1991, a Manufacturing Techonology Issues Forum was organized by Don Brunet and held at Los Angeles Trade-Technical College with representatives from business, industry, labor, government and education present. Before a packed auditorium, the industry leaders pledged to help students in the audience become interns in manufacturing technology, especially with the precision machining companies.

In addition, industry leaders who were present, commented on the obsolete equipment being used in college training programs, and therefore, support for IMAR (a technology transfer project) at Trade-Technical College was encouraged.

As a followup to the forum, the author, who was PARTNERSHIP 2000 Project Director, invited the chief of JETRO (Japan External

Trade Recovery Organization) to visit several precision manufacturing companies located in the San Fernando Valley, along the foothills of Glendale and Pasadena, and the Rancho Cucamonga area because of the Japanese official's previous comment that Japanese companies were interested in increasing their imports of manufactured products that met their tolerance specifications.

Instead of this forum resulting in further student internships and faculty growth opportunities, this project was eventually dropped by PARTNERSHIP 2000 because ED>NET was to assume this area of economic development.

VII. HIGH TECHNOLOGY DEMONSTRATION PROJECT

In 1991, PARTNERSHIP 2000's HIGH TECHNOLOGY DEMONSTRATION PROJECT was launched at Los Angeles City College under the direction of Chadwick Woo, Jr and Dr. Eugene Antone.

The project was designed to do the following:

1. establish and expand college and corporate partnerships for educating, training, developing internships and employment of disabled and disadvantaged students;
2. establish staff development and technical assistance to college and corporate personnel for developing and expanding linkages in preparation for employment of disabled and disadvantaged students in high technology careers; and
3. establish cooperative training programs and internships which feature practical hands-on experience in preparing disabled and disadvantaged students for high technology careers.

At City College, there was a "buy-in" from faculty in the following disciplines: art, business, computer technology, electronics, radio/television/film, radiological technology, and office administration.

Working relationships were established with large corporations such as Allied Signal, Digital Equipment, General Dynamics, Hughes Aircraft, IBM, Lockheed, McDonnell-Douglas, Northrup, Rockwell International, TRW, and Xerox. The student internships were highly successful experiences not only for the student, but also for the employers.

HEALTH CARE ISSUES FORUM

On February 21, 1991, PARTNERSHIP 2000 through Dr. Cassandra Carraway, Associate Project Director for that year, sponsored a HEALTH CARE ISSUES FORUM at San Diego City College.

Attending were faculty from community college nursing programs, representatives from health care providers and the California Department of Education.

The Issues Forum identified areas of concern such as the following:

1. partnerships between business and education are essential for training;
2. mobility from LVN to RN is critical to quality patient care;
3. reiterating the importance of re-educating high school career counselors and college counselors regarding significant changes and opportunities in the health care field,
4. need of health occupation faculty to work in industry at designated intervals to keep up-to-date on industry developments, and
5. relating language issues to patient care, academics, and state board licensing examinations since many students are non-native English language speaking persons.

This was another industry where strong partnerships need to exist in order to link the four silos together. It was another one to fall to the wayside so that ED>NET could pursue the establishment of these types of partnerships.

PART III THE PARTNERSHIP 2000 PROCESS

As perfected over a period of several years, the process has been simplified to the following model:

1. Stage a forum to which experts are invited to share their vision as well as issues that are barriers to fulfillment
2. Validate the appropriateness of the vision as well as issues to be addressed
3. Develop plans for professional staff development of faculty, counselors, and administrators
4. Develop plans for curricular revision and articulation for career ladders
5. Develop plans for student scholarships and internships primarily as a "capstone" experience

The Board of Directors directed that PARTNERSHIP 2000 add specialists so that an advisory committee existed for each of the following arenas:

1. Utilities and Energy
2. High Technology Manufacturing
3. Telecommunications
4. Banking
5. Transportation
6. Aeronautics and Aviation

In 1989, legislation was passed to create an organization to promote economic development in California, primarily through the California community colleges. This resulted in the formation of the present day ED>NET.

I. ROLE DEFINITION FOR PARTNERSHIP 2000

The legislation creating ED>NET was designed to "sunset" in December 1994 (a five year life span). In its creation and design for economic development, it became quickly obvious that the economic development network was to unify training for designated industries and worksites. The Executive Council, the steering group of ED>NET, created centers for focused activities, each

staffed with a salaried coordinator and paid consultant.

In addition to the centers, California was regionalized into six areas with a lead college being subsidized to coordinate economic development activities.

In meeting with the ED>NET Executive Council and key leaders, the role to be played by PARTNERSHIP 2000 was sharply curtailed to limit its focus to aviation maintenance and operations programs rather than its more ambitious goals in several industries. Coming to this conclusion was inevitable because of availability of funds, the legislative mandate, and visibility among economic development players.

During this five year period of 1989 through 1994, funding for partnership activities through PARTNERSHIP 2000 decreased from $200,000 Perkins (federal) funds to $100,000 annually whereas ED>NET was increasing from $4 million to $14 million.

In 1994, ED>NET is being forced to undergo a state audit in preparation for continued existence under AB 3512 for another five year span. Under new legislation, the organization will be re-engineered and in many respects, will resemble the approach taken by PARTNERSHIP 2000 to design a web of activities to strengthen the teaching and learning processes between educational providers, training institutions, and the other partners, namely, business and industry, along with organized labor, and governmental bodies.

What is becoming more evident with the passage of the "term limits" mandate from a citizen initiative a few years ago, is that the California State Legislature will be more directive and prescriptive in its approach to economic development. Partnerships

is a term that is more frequently written into legislation and new bills being debated.

PART IV EXPERIENCES WITH EXEMPLARY AVIATION PARTNERSHIPS

I. FACULTY PROFESSIONAL GROWTH WORKSHOPS

In 1988, PARTNERSHIP 2000 featured a week's intensive workshop at San Jose State University's Department of Aviation on the subject of composites (laminated plastics and resins used in today's aircraft). This workshop was held to meet the most immediate need of faculty according to a survey of faculty needs, as administered by Vito Ciarfaglio and later by PARTNERSHIP 2000.

Vendors of composites were brought from throughout the United States to work with faculty from the community colleges and a private aeronautics school.

Evaluation of the workshop from the faculty in attendance pointed out their appreciation for the instruction as well as the many donated printed materials that could be adapted easily to the classroom.

In 1989, the workshop turned to jet engines and avionics (aviation electronics). This workshop was held in Los Angeles at the Continental Airlines maintenance hangar as well as the Aviall jet engine rehaul facility in Burbank. Major engine producers such as Pratt & Whitney, General Electric, and Rolls Royce provided lectures and instructional materials that were, once again, donated for faculty's classroom use.

In 1990, the workshop turned again to composites at San Jose

State University. However, this was designed to work with advanced composites. Vendors, once again, provided much instructional materials.

In 1991, the week's workshop turned to improving classroom delivery methods through use of the computer. It was a revelation that many aeronautics faculty needed much more experience with lesson planning and implementation through computer-based instruction. For this workshop, computer hardware and software vendors served as leaders, and each faculty member in attendance had an assignment to develop a lesson planned through the computer and which, eventually, was demonstrated to his colleagues as a final test.

In this final, one of the invited guests was State Senator Alfred Alquist, who often visited the aviations program at San Jose State University.

The evaluation of this workshop by those in attendance was especially outstanding. This says much about the need for improving teaching methods for aviation faculty.

In 1992 and 1993, the traditional week's workshop was not held because of funding difficulties. As for 1994, this faculty professional growth activity is included in a separate section under the title of "1993-1994 Program Report."

For 1995, the changed leadership in the Chancellor's Office, California Community Colleges, has moved the accountability for these types of faculty professional growth programs to the faculty through the Statewide Academic Senate.

II. STUDENT INTERNSHIP PROGRAMS

In 1989 and 1990, PARTNERSHIP 2000 worked with the United Express leadership to provide a capstone experience for community college aviation program graduates at its facility in Fresno, California. Groups of six students were identified in the community colleges and invited for training on United Express airplanes. The interns lived in residential dormitories and worked for six weeks, five days a week, on specific activities. Vito Ciarfaglio of City College of San Francisco coordinated these student internships.

These capstone courses were greatly appreciated by the students. The only student objection to this type of internship was the long weekend break..students preferred to have an intensive workshop without any breaks. This type of student internship will be described more fully in a separate section called, "1993-1994 Program Report."

III. AERONAUTICS AND AVIATION TRIATHALON

The triathalon was designed to foster competition and work excellence by teams of students from various community colleges. It was captained by Dr. Gene Little of San Jose State University and Ray Goldsby of United Airlines. It was sponsored by PARTNERSHIP 2000, San Jose State University, and United Airlines. Awards were donated by major vendors of supplies, tools, and equipment. First place in 1992's contest was awarded a tool kit with a $5,000 value.

This activity was held, once again, in 1993, at San Jose State

University with leadership assumed by Lou Gusto of United Airlines.

The triathalon has been a highly successful event, having teams from several schools competing for excellence through sharpshooting techniques.

IV. CURRICULUM REVISION SEMINARS

With the revision of Part 147 of the Federal Aviation Administration training requirements, PARTNERSHIP 2000 co-sponsored a curriculum revision seminar at San Jose State University with the University and United Airlines. The seminar was designed to upgrade instructors and provide professional development in course building, computer based training and curriculum development in 1991.

A curriculum articulation conference was held in early 1991 to complete and seal more than 30 articulation agreements between the State University and aviation educators from the community colleges.

V. VALUE OF WORKING PARTNERSHIPS

United Airlines, through several of its diligent leaders such as Ray Goldsby and Lou Gusto, donated two Boeing airliners from its commercial fleet to San Jose State University and the City College of San Francisco for their faculty to use as an instructional aid.

Airplanes unto themselves are crowd-catchers; however, being used in the teaching programs give students a better understanding of what is being learned. They can also be career developers such as witnessed by the many students from San Jose City Schools who

have visited the United Airlines airplane at the University's hangar at San Jose International Airport.

PART V SUMMARY OF 1993-1994 PARTNERSHIP 2000 ACTIVITY

I. FORUMS.

Two large forums were held. The first was in San Francisco with representatives from the FAA, US Department of Defense, California's Transportation Department, United Airlines and Boeing Airplane Company making major presentations. Several community college chief executives, faculty, labor, and bureau chiefs were in attendance and participated in roundtable discussions. From this forum flowed a linkage from FAA to several community colleges for developing the "new" FAA technician.

A second forum was held in May 1994 in Los Angeles. For this forum, we wanted to validate much of what was recommended at the November 1993 forum. This forum was composed mainly of community college faculty and was highlighted by presentations from Wellford Wilms of UCLA speaking on his study of linkages between international firms operating in California, and from Leo Coleman, a noted futurist, who posited that the technician is the talent of the future. High school graduation is not adequate to meet the demands of a world-class workforce.

The recommendations flowing from these forums are attached as summary statements in the Appendix, Part VI.

II. FACULTY INTERNSHIPS.

Vito Ciarfaglio of City College of San Francisco and Bill Mallory of Glendale College were contacted in July 1993 to initiate the coordination of faculty internships, primarily with United Airlines in San Francisco and Continental Airlines in Los Angeles. Vito was designated to coordinate the North and Bill to do the South.

In October 1993, lists of faculty from 18 community colleges and several occupational centers as well as private aviation schools were compiled by the coordinators.

These faculty were sent a survey questionnaire from Los Angeles Mission College to indicate their interests for a faculty workshop, topics of interest, times and length of sessions, and preferred locations. Of the 90 survey instruments sent, 7 were returned prior to the December cutoff date. A second mailing and telephone calling in January resulted in a total of 14 responses.

Since Bill Mallory became hospitalized for surgery, Vito Ciarfaglio worked with United Airlines to develop a schedule of training sessions for United personnel which could be attended by any faculty member having appropriate United clearance. With this information available, four community college faculty responded with interest to attend to which they were invited in May and June, 1994.

The changing economics in the airline industry did not help the coordination or lack of coordination of faculty internships. Continental Airlines, through Douglas Grant, kept telling this writer that he was quite uncertain whether Los Angeles would remain

a maintenance hub for its maintenance technicians and repair work. At the same time, community college faculty had difficulty committing themselves to staff development for professional growth.

It is fortunate that four faculty were able to take advantage of an internship opportunity provided by United Airlines.

III. STUDENT INTERNSHIPS

This is the arena where United Airlines provided major opportunities for students to have internship opportunities.

In November 1993, 24 students from aviation maintenance programs at the College of San Mateo, City College of San Francisco and San Jose State University were able to conclude a six weeks internship at the San Francisco maintenance base of United Airlines. It was positive to note that three interns were female in a craft that generally attracted only males.

Student evaluation of their experiences rated it excellent. The enthusiasm and learning experiences were positive. The flavor of the internship is seen in a correspondence from Lou Gusto of United Airlines, which is included in the Appendix.

An appreciation luncheon highlighted their culmination of a capstone experience. At this, the author, as Project Director, represented PARTNERSHIP 2000. United Airlines had their major players including Terrance Rendleman, Vice President for Maintenance, presenting certificates of completion. Mentors were acknowledged and honored by United Airlines as well as PARTNERSHIP 2000.

A similar student internship program was concluded in April

1994 and another one with 45 students started in June 1994. The major findings from these student internships were that students not only enjoyed these capstone experiences, but also, got a preview of the work and working environment.

The major coordinators for this effort were Lou Gusto and Rummel Thomas of United Airlines and Vito Ciarfaglio for the interns as well as the mentors.

These student internship programs are of such significance that United Airlines has assigned George Rivas, a longtime United Airlines veteran, to work fulltime to coordinate this program with community colleges and universities. That is what a working partnership has meant to United Airlines, and to which, their leaders are giving credit to PARTNERSHIP 2000.

PART VI SOME COMMENTS ON THE FUTURE OF PARTNERSHIP 2000

Although one major funding source for PARTNERSHIP 2000 was special funds from the Federal Perkins Act and cannot be called upon as a major funding source, it is the intent of the Board of Directors to continue to meet on a regular basis to invigorate its "think factory" and develop strategies to enhance partnership activities in new spheres of activity.

At the July 18, 1994, session of the conference sponsored by the League for Innovations in the Community Colleges and the University of Texas, PARTNERSHIP 2000 presented a story of its exemplary aviation programs with United Airlines as the main focus of presentation. Dan Estrada, Lou Gusto, Vito Ciarfaglio and the author participated.

In October, 1994, several Board members are expected to meet at the **Pacific Region Conference of the Aviation Technical Education Committee (ATEC)** in Sacramento. A Joint Conference in the future is being planned.

Also, several Board members are expected to join the **Technical Advisory Committee for Aeronautics (TACA) of the California Transportation Commission** to plan a conference for October 1995 (more than a year away).

PARTNERSHIP 2000 is also being requested to contribute to **Project California** through its principal investigators, David Wilson and Belle Cole.

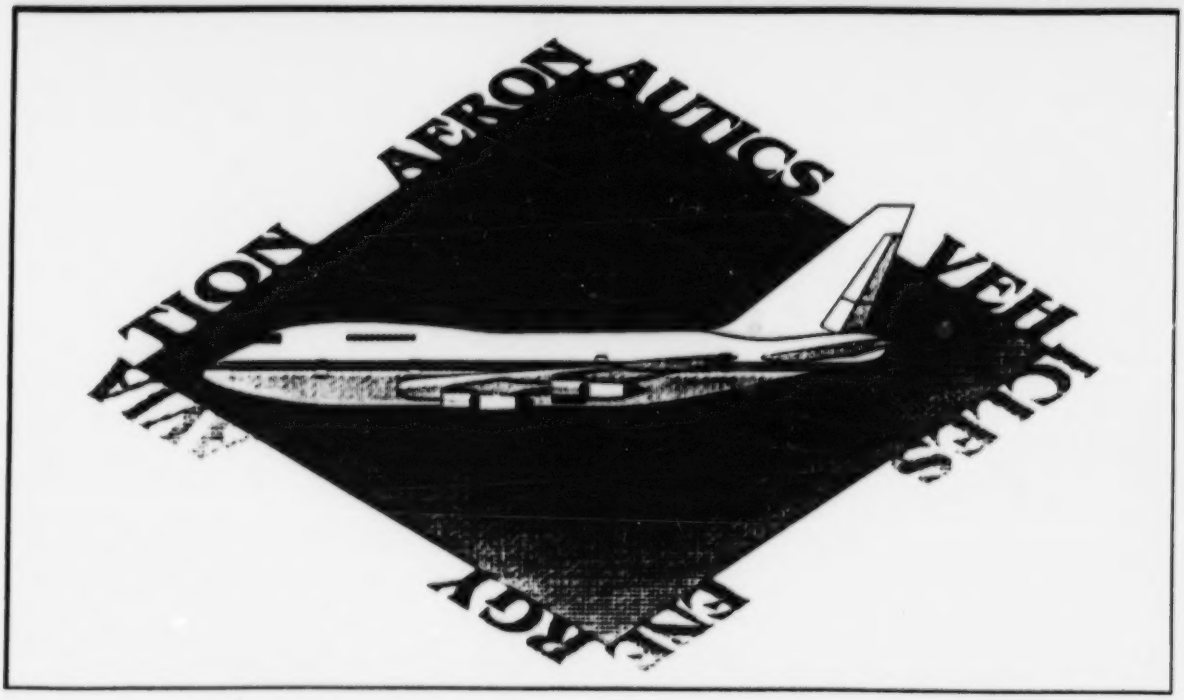
In addition, this writer has been meeting with Phil Borden of the **California Consortium for Transportation Research and Development** to provide comments for the aeronautics sector.

In these ways, PARTNERSHIP 2000 will continue to exist; however, more importantly, it is the philosophic and working relationships of the partnership concept that has taken hold and being embraced by those who formerly occupied the four silos. This has given this writer and many of his associates who have had a common bond through PARTNERSHIP 2000 a "breath of fresh air" with the knowledge that what we believed is truly what has been and is currently effective.

PART VII APPENDIX

I. Recommendations from Aviation Forums, November 1993 and May 1994.
II. Student internship program information from the 1993-1994 United Airlines experience.

CONTINUING THE CHALLENGE FOR EXCELLENCE IN EDUCATION



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1993 Partnership 2000 Aviation Forum

18 November 1993

Summary

by

Kay Inaba

Executive Summary

The 1993 Partnership 2000 Aviation Forum included participants from aircraft manufacturers, airlines, FAA, DoD, and California community colleges (CEOs or designated representatives. The objective of the forum was to determine trends and needs relevant to aviation maintenance technicians, and define a course of action needed to meet the needs.

A recent study by a member of the forum indicates that the nation will need about 387,000 maintenance technicians over the next two decades. The need in California is about 2,000 to 2,500 per year over the 20 years, representing over a billion dollars in wages.

The forum believes that California does not understand the criticality of aviation to the state, nor the critical needs of aviation. In addition, the workforce is virtually devoid of diversity, and the schools are not guiding minorities into aviation maintenance. In fact,the forum believes there is a general deterioration of technical programs in K - 12 schools that is increasing the difficulty of developing a qualified technical workforce.

The forum recommends a major program to increase the public awareness of the role of aviation in California, including the involvement of top legislators. Properly supported, aviation maintenance could be a a major source of revenue for California for many decades.

The forum recommends a major outreach program to the K - 12 schools. The technicians of 2005 are just starting their education in elementary school now.

Successful partnership programs such as internships for both faculties and students should be expanded. However, because of the neglect to date, even such expansions will not meet the forthcoming needs.

The forum recommends that the community colleges consider the possibility of developing regional centers for aviation maintenance training, with other schools serving as feeders.

The regional center concept can be strengthened by using telecommunications, simulation, and distance learning technologies. Such an approach would help increase diversity in the workforce by extending the training into campuses serving minorities living in impoverished communities without investing in expensive equipment. Through the application of simulation technology developed in DoD integrated with distance learning technology, virtually any community college can serve as a feeder school. The students can graduate from the feeder school to the regional centers for final preparation.

The forum also recommends more extensive use of telecommunication technology to forge the partnership into a cohesive whole.

The general objective of the forum was to discuss relevant trends in the aviation industry, the level and types of skilled personnel required, current and future education/training barriers, and the school system's role in overcoming the barriers and meeting the needs.

The forum included aviation and instructional technology specialists and school administrators. The specialists in aviation provided a context of the general direction of aviation, their need for qualified personnel, and barriers to meeting their needs. The instructional technology specialist presented relevant instructional technology developed by the Department of Defense.

Dr. Jack Fujimoto, the project manager of Partnership 2000, opened the forum and set the stage for the sessions. The general arrangement was designed to foster interactions between the participants both during and after the formal presentations.

Keynote Address

Tom Heller, Vice President of Maintenance for United Airlines, was the keynote speaker. Tom stressed the importance of the synergistic approach and the role of partnerships of schools and industry such as Partnership 2000. In order to survive in the global economy, companies such as United Airlines must provide quality services/products, timely response to the customers' needs, and contain costs. This requires a quality workforce that must be constantly replenished by the educational system.

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United Airlines has been a strong supporter of Partnership 2000 and has provided internships for both faculty and students, and donated a variety of training materials, engines and even airplanes. Air transportation is a growing industry that is experiencing improvements in technology and increase in the complexity in jobs, resulting in an increased need for higher skills. These needs can only be met through an effective partnership between the schools, government and industry.

Presentation by Panelists

Subsequent to Mr. Heller's keynote address, four panelists made formal presentations.

Jim Lukins - Boeing Jim presented Boeing's emphasis on quality, reducing recycle time, and cost containment. He suggested that the gap between the skill needs of the industry and the skills produced by the education system continues to increase, and emphasized the importance of the partnership to help close the gap. Some of the reasons for the gap are entrenched and outdated curriculum, limited basic skills in the student population, limited number of youth interested in aviation, inadequate management attention to the situation, and lack of consideration of new airplane technology.

The new technology impacting training include advanced digital systems, composites, fly-by-wire, fiber optics, and local area network. He stressed the importance of the partnership of government, schools, and industry in K - 12, and expressed concern about the deterioration of technical programs in K - 12 schools. He presented specific suggestions to meet the needs. Copies of transparencies with the suggestions are presented in the appendix.

Lou Gusto - United Airlines Lou presented more details of United Airlines' role in Partnership 2000, illustrating the support and commitment of top management in United Airlines. United Airlines has an extensive internship program, and actively recruits mechanics from the schools. United has donated three Boeing 727 - 100 airplanes to schools, two in California.

He encouraged publicizing opportunities for faculty and student internships since it is an effective way to increase awareness as well as to transfer knowledge. He noted that the partnership has helped the California Community Colleges become well positioned to produce the technicians needed by the industry. He also emphasized the need to "sell" the aviation occupation to K - 12 schools.

Elmer Frasure - FAA Elmer described FAA's movement towards greater automation, it's impact on maintenance in the future, and it's program to create the Airway Transportation Systems Specialist GS 2101. This position is designed to provide system level maintenance in centralized locations, as well as to keep pace with the introduction of new technology. The systems specialist is a generalist and needs to know all the systems, albeit not to the same depth as the specialist. Approximately 10% of FAA's future maintenance workforce is expected to be the system specialist. There does not seem to be a comparable movement in other segments of aviation at this time.

Also, Elmer described FAA's Collegiate Training Initiative for electronic technicians, a program with community colleges to train electronic technicians. Relevant information is included in the appendix.

Dr. Robert Smillie - Defense Modeling and Simulation Office (DMSO) Bob described the growth of the modeling and simulation technology and its relevance to maintenance training. The Department of Defense is in the process of applying the technology to improve the effectiveness of Department of Defense Dependency Schools (DODDS). The merger will foster improvements in the DODDS by harnessing the capabilities of the distance learning technology. This is a technology directly relevant to the community

college system, especially in its mission to support local communities and industries.

The merger is part of DoD's dual use technology program. The purpose of the program is to "...share resources between military and civilian sectors that exploits DoD technologies and available capabilities as an approach to the development of an educational gateway on the information super highway." This program could be a potential means of expanding distance learning capabilities in the California Community College system.

Response by Community Colleges

Dr. Tom Stevens from Los Angeles Trade Tech College, Dr. Richard Giese from Kings River Community College, and Joe Zagorski from Mt. San Antonio College presented summaries of programs at their respective schools and some of the major problems that are inhibiting their progress. In addition, comments from all participants were successfully solicited by Dr. Jack Fujimoto.

Dr. Stevens agreed that air transportation is a growth industry, and recognizes that the community colleges will have a difficult time meeting the needs. Existing staff members need to be retrained, and their interest needs to be rekindled. Programs need to be instituted to ensure that the training programs will meet the needs of industry. This has to be accomplished with a clientele that is different from the past and requires much more attention to upgrading their basic skills. The question is how to accomplish this when the resources for the community colleges have been reduced dramatically. He also restated the importance of the partnership.

Dr. Giese reinforced the notion that air transportation systems must compete in an international arena, and the challenges to schools are increasing with the introduction of such technological innovations as composites, fly-by-wire, and fiber optics. At the same time, there has been a reduction of "hands on" training in K - 12 schools, contributing to the reduction of the general preparedness of youngsters for careers in technical fields. However, he believes there are resources available to help meet the challenges.

Some of the solutions he suggested include application of the tech prep program for aviation maintenance, and not trying to be everything to everyone. As part of the latter, he suggested career centers that specialize in specific occupations. He also noted that King River CC requires certification for reading, writing and calculation to qualify for an Associate of Science degree. He felt that allowing students to graduate without the basic skills is harmful to the schools as well as to the students and industry.

Joe Zagorski reviewed the variety of obstacles placed in the path of Community Colleges to meet the challenges posed by industry. Such obstacles include over-regulation of the colleges, lack of emphasis on the technical subjects, distance learning regulations inhibiting progress towards execution, and lack of emphasis on maintenance by modern society. He suggested consideration of regional training centers, especially for occupations requiring expensive equipment.

Other Participants

Subsequent to the presentations and responses by the college executives, Dr. Fujimoto guided the group in discussing important issues for the aviation segment of Partnership 2000. The objective of this part of the forum was to identify key issues that need to be addressed by the Partnership in order to advance aviation maintenance training.

The other participants included the following:

Dr. Gino Antone
Deke Brown (Loral)
Don Brunet
Vito Ciarfaglio
Hon. Don Clauson

Ray Goldsby ((HKS&A)
Elmer Haskin
Jack Kimmerly (Department of Transportation)
Dr. Gene Little (San Jose State)
Charles Miller (Lockheed)
Benson Munger
David Sickler (AFL-CIO)
Ben Tom (Yosemite)

Issues

1. The state of California is not convinced that aviation is critical or has critical needs in aviation. Participants suggested ways to increase public awareness of the criticality, including meetings with airport managers, organization of teams to work together to increase awareness, inviting representatives from Mexico and Canada to the aviation forum, and having the governor assign an Aviation Education week.

2. A study by Ray Goldsby and associates support Tom Heller's contention that air transportation is a growing industry. According to the report, the industry needs 170,000 more maintenance technicians by 2004, and 217,000 more by 2015, for a total of 387,000. The increase in demand is expected to start in 1995. The average is about 17,000 to 20,000 per year. California's share should be about 2,000 to 2,500 per year, and perhaps more if the state can provide quality workers in a consistent and reliable manner. This is a significant number for a job-starved state such as California. If 50% of the income of approximately 20,000 maintenance technicians are spent in California, the technicians represent nearly $1.5 billion in additional income for the California economy over the next decade.

3. The school systems are not moving in the direction of meeting this need. There are student vacancies in aviation training programs now, and little is being done to foster interest in the K - 12 system. Effective outreach programs such as those implemented by Boeing in the Seattle area are the exception rather than the rule. United Airline has tried similar programs in California but the schools have not shown much interest.

4. There is a general deterioration of technical programs in K - 12 schools. Effective partnerships between government, schools, and industry are needed to stem this deterioration in preparing the workforce for aviation, as well as for other technical fields. The partnership should consider adopting such effective collaborative programs as youth academies and tech prep programs. Both are being applied quite effectively in health care.

5. Programs such as internships and mentors in industry are highly effective and appreciated by the participating schools, but they do not reach the community colleges in the more remote areas. Nevertheless, College CEOs agree that partnerships are essential to the community colleges and emphasized the need to sustain and expand the program. It should be noted that the need for quality technicians in aviation maintenance far exceeds the number of students in process now.

6. The aviation maintenance field is virtually devoid of diversity, i.e., the current workforce does not reflect the diversity of the population. The recruiting efforts need to have a strong outreach component to the minority communities. The minority communities represent a fertile source of highly motivated workers when properly prepared and nurtured. The anticipated need for quality workers in the next decade represent a potential win-win scenario for the minority communities as well as for the aviation industry.

7. The current gap between the need for qualified technicians and the supply is an opportunity to use the aviation maintenance field as a model of how a major problem can be solved by appropriate leadership, planning, and collaboration. The partnership should develop a matrix of needs (for different types of technicians and capabilities) per year over the next decade, and develop an integrated plan to meet the needs

through the combined efforts of the partnership members.

The plan should include programs to recruit students in the junior and senior high schools (especially in minority communities), as well as tech prep study programs to get more high schools involved. Without such a plan, the state could lose the opportunity to fill the need for 2,000 to 2,500 well paid maintenance technician jobs per year over the next two decades. With a program supported by the state, this number could become larger by attracting more maintenance facilities in California. A quality workforce with a supportive educational system and a support of the state legislative bodies could be a major attraction.

7. Consideration should be given to using the telecommunication technology to forge the partnership and related schools into an even more cohesive whole working in concert to implement the plan. Start with an e-mail network, then expand as opportunities arise to integrate the network with the distance learning system.

8. Determine the feasibility of developing regional training centers for aviation maintenance with other community colleges serving as feeders. Through simulation technology, many courses can be offered at numerous community colleges throughout the system without investing in expensive equipment. Such an approach will help meet diversity goals as well since it will bring the training within the grasp of minorities in impoverished communities that cannot afford to travel to schools offering aviation maintenance programs.

The regional centers can work with their industrial partners to develop relatively inexpensive simulators based on the technology developed by the Department of Defense. The cost of development can be shared by the industrial partners. Consideration should be given to approaching the Department of Defense for a joint venture project as part of DoD's dual technology program. The latter is a program that emphasizes supporting civilian application of technology developed by the Department of Defense. Instructional technology appears to meet the criteria for dual technology programs.

9. Use distance learning technology to implement the plan with particular emphasis on accelerating the skill base of the faculty, enhancing student learning, leveraging the availability of state-of-the-art equipment in selected locations, and reinforcement with pc-based simulators. Distance learning technology will help the regional centers manage the training process in the feeder schools. Just as important, distance learning technology will help prepare the facilitators in the feeder schools.

Partnership 2000

Jack Fujimoto, Ph.D. Project Director
Los Angeles Mission College

The Future of Air Transportation in California

A Partnership 2000 Forum

by
Kay Inaba

27 June 1994

Partnership 2000

Jack Fujimoto, Ph.D. Project Director
Los Angeles Mission College

The Future of Air Transportation in California

A Partnership 2000 Forum

Introduction

Partnership 2000 has been an effective partnership in advancing the state of training of aviation maintenance technicians. According to public testimony, California's state government as well as its community colleges are neglecting aviation maintenance training.

Partnership 2000 (P2000) is a project sponsored by the Chancellor's Office for California Community Colleges (COCCC). The partnership is part of both a state-wide and nation-wide emphasis on partnerships to improve the effectiveness of the ***school to work*** transition so sorely needed for the United States to keep pace with its competitors in world trade.

Through directives from the COCCC, the partnership's scope, during this term of Carl Perkins' funding, has been limited to aviation. Despite a limited budget, the P2000 has been quite effective in implementing an internship program and in providing a forum for the partners concerned with aviation maintenance to discuss shared problems and ways to solve the problems.

The first forum in fiscal year 1994 was held in San Francisco on 18 November 1993. A report on that forum is available through Los Angeles Mission College. The second forum, held on 24 May 1994 is the subject of this report.

The Appendix presents the agenda and resumes of the speakers.

Wellford "Buzz" Wilms, Ph.D.

Dr. "Buzz" Wilms' studies of high performance workplaces provides a glimpse of what companies can accomplish when they properly "tap" the productivity inherent in their workplace. One of the more telling arguments for the approach is that the plants are producing quality products at lesser cost than their foreign competitors with significantly lower wages. This should be quite encouraging to those con-

Industrial anthropology is an innovative application of a profession usually associated with ancient or primitive societies. It is a rational way of looking for ways to replicate the success of organizations that learn to cope with the rapid rate of change in business.

cerned with losing plants to third world countries with low wages. His studies demonstrate the value of nurturing the workforce.

The industrial plants studied by Dr. Wilms and his team of industrial anthropologists provide an indication of what to expect from the factories of the future as international competition forces corporations to become more competitive. The solution is not always to move to locations with lower wages, or automation. The companies he studied chose to convert the extant workforce into a high performance organization, and compete effectively.

Dr. Wilms' adoption of an anthropological approach to studying extant organizations shows considerable promise in defining key factors contributing to the success or failure of organizations. His studies of high performance workplaces provide a foundation for other companies to replicate the process. His proposal to apply the technique to community colleges should be given serious consideration since there is considerable evidence that educational institutions are not keeping pace with the rate of changes in the world surrounding them.

Leo Coleman, Ph.D.

The rate of change is so rapid now that our knowledge base is doubling every two years. This is the environment facing the technicians being trained today.

Dr. Leo Coleman, the luncheon speaker, provided a view of the rapid rate of change we are experiencing and the implication on the training and education community. Currently, our knowledge base is doubling every two years. Yet our institutions are saddled with processes spawned when the rate of change was at a much more leisurely pace. Institutions failing to keep pace will become irrelevant and obsolete. If community colleges fail to keep up with the rate of change, industry will seek other sources for its training because it cannot afford to wait.

At the same time, Dr. Coleman noted that the need for effective community colleges continues to increase as the rate of changes continues to accelerate. The workers of tomorrow need more than a high school education to be able to cope with the rapidly changing industrial community. Given the ever increasing rate of demand for the "products" of community colleges, a responsive community college system should thrive in this rapidly changing environment.

Partnership 2000

The panels were designed to focus on solutions. The earlier forum and intervening meetings defined the general scope of the problem facing aviation maintenance training in California. Thus, the general objective of this forum was to work with industry to seek a partnership solution to the problem.

The forum in November declared that *"the state of California is not convinced that aviation is critical or has critical needs in aviation."* Aviation maintenance is the type of industry generally sought by California because of its need for skilled and well paid technicians. Yet, the state has not made any concerted effort to retain the aviation maintenance business in California. At the same time, California is spending considerable amount of money and energy pursuing new technology fields with less potential for skilled job spaces than aviation maintenance.

Partnership 2000 has been battling a huge barrier of indifference in the state. The partnership decided to continue its operations despite the lack of any foreseeable funding because aviation maintenance has no one else to advance its cause.

Partnership 2000 (P2000) has been battling a huge barrier of indifference in the community colleges and the other school institutions, the public, and the state leadership towards aviation maintenance. The partnership realized that if it ceased to exist, support for the aviation maintenance industry in California would erode at an even faster rate.

At a previous planning session, the steering committee for P2000 chose to continue the partnership even without support from the COCCC. In fact, because of the lack of support from COCCC, many members of the partnership felt that the partnership would be more effective when separated from COCCC. However, the question was how much could the partnership hope to accomplish without any funding support. Thus, a major objective of the forum was to seek a way to continue to advance the aviation maintenance industry in California without support from COCCC.

Panel Discussions

The forum was partitioned into three panels. The first panel consisted of representatives from the airline industry, featuring Steve Regulinski of United Airlines (VP of Maintenance). This panel was asked

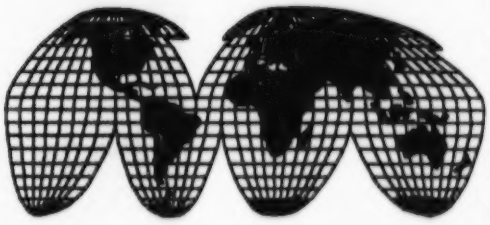
to define the future of aviation maintenance in California. The second panel focused on policy issues important to the future of aviation maintenance in California. Most of the participants were in the third panel. This panel was asked to focus on programs and commitments needed to meet industry's needs without relying on support from COCCC.

Panel A: The Future of Air Transportation in California

Aviation is a growth industry requiring skilled technicians that command good pay. People in the industry are learning to compete in the international arena, but California's benign neglect is leading to continued loss of aviation maintenance jobs.

The industry perspective was presented by Steve Regulinski and Lou Gusto from United Airlines and Scott Vandenberg from Continental Airlines. Vito Ciarfaglio discussed the interface between the airline industry and the community colleges. David Wilson from PMR provided some insight regarding how to get support from the state.

- Aviation is a growth industry. Currently, it is growing at a 4% rate that will increase to 6% - 8% rate in the future.
- Aviation is a competitive industry. Cost governs activities both in flight amenities and maintenance. Many airlines are moving in the direction of outsourcing maintenance in their attempt to cut costs. The California sales tax on parts is one of the reasons why cost of maintenance in California is higher than in many other states. With the airlines' concern with costs, the sales tax on parts does not bode well for the future of aviation maintenance in California.
- Aviation is an international industry. United Airlines serves five continents and a third of its revenue is from international operations. Currently, 90% of the workforce is domestic but that can change quite easily. The potential of international competition in maintenance (e.g., maintenance depot in Tijuana) is fostering a greater sense of cooperation between airline management and the unions. In this sense, the unions are ahead of the state of California since the state is not taking any concerted action to retain the aviation maintenance business in California.



- Aviation is a cyclic industry. In 1980, United Airlines laid off 1200 mechanics and recalled them in 1983. The corporation started hir-

ing again in 1984, and accelerated the pace in 1988. (Note: Of the 6,000 technicians hired in the past decade, 90% were from out of state.) The pace was interrupted by the recession, but United is still planning to expand its maintenance force. There are 200 technicians at Indianapolis now, and United plans to hire an additional 1400 in 1995. The plan is to build up to 6,000 technicians by the year 2003. Currently, there are 8,000 technicians at the San Francisco/Oakland airports. The hiring at the SFO/Oakland will be limited to replacing those lost through normal attrition which is expected to be about 3% - 4%, or 240 - 320 per year.

- In contrast to United Airlines, Continental is downsizing its maintenance force. It has laid off 1000 technicians in the past year. It plans to further reduce its maintenance force in California because of the higher cost of "doing business" in California. In addition, Continental is introducing new airplanes which means even less maintenance, especially in the near future. However, the maintenance force in general will probably start to grow again near the end of this decade. If other airlines have cycles similar to Continental, California has about a five to six year window to make California more attractive to the aviation maintenance industry. The question is whether the partnership can generate enough interest to institute a program to realize the jobs potential inherent in aviation maintenance.

Industry recognizes the high cost of aviation maintenance training and has cooperated quite extensively. This sense of cooperation is not reciprocated at the higher levels of either the community colleges in general or the CEOs of many colleges with aviation maintenance programs.

- The airlines recognize the high cost of training aviation maintenance technicians, and are supportive of the community colleges' aircraft maintenance programs. However, industry believes that state officials as well as CEOs of many community colleges with aviation maintenance programs are not aware of the critical nature of such key maintenance training programs as student and faculty internships. A true partnership requires the executives of both sides of the partnership to be fully aware of what it takes to meet each other's needs.
- Both new technology and management philosophy are placing a greater demand on technician training. There is a greater emphasis on teamwork and decision-making at the technician level. The rapid change of technology also means that the technicians must have good learning skills.

- Regarding new technology, the areas requiring special attention are avionics and structures because of the increased use of composites. However, even the conventional areas are changing quite rapidly because of advances in technology.
- The community colleges need to be more responsive to the needs of industry. The community colleges need to treat the airlines as customers. The rapid change of technology means that the colleges cannot keep up with the changes unless they establish a win-win partnership with industry. Such a relationship is difficult to establish without the support of the CEO of the college and an umbrella of support from COCCC.
- Despite the current movement away from California, there are some trends that could be beneficial to California if aviation maintenance is given proper attention as an economic opportunity. Many airlines are moving in the direction of more turn-around maintenance which distributes maintenance across the country, rather than rely mostly on periodic maintenance at major facilities. Turn-around maintenance is conducted at a destination airline terminal where an aircraft is prepared for a return flight, i.e., undergoes turnaround maintenance. Because of the strategic location of California airports, this trend could lead to more opportunities for maintenance in California if the state decides to take advantage of the opportunity. Also, the trend for outsourcing maintenance provides opportunities for companies in related industries (e.g., defense work) to enter the aircraft maintenance business.

There are some interesting potential for growth of aviation maintenance in California, despite the neglect to date. Whether the state can take advantage of the opportunities depend on whether the partnership can mobilize sufficient support.

- Project California focuses on advanced surface transportation technologies, not air. However, there are areas of overlap that could be beneficial to aircraft maintenance. Specifically, the project's emphasis on helping small companies to grow can be effectively integrated with the technological growth in the airline industry, the trend for outsourcing, and the trend for distributing maintenance. It seems worthwhile to explore whether Project California could support the growth of small businesses in the new technology aspects of aircraft maintenance.

Panel B: Policy Actions

The magnitude of neglect is so great that it is highly unlikely that any policy change is feasible at this time.

The partnership's failure to attract policy makers from the state to attend the forum is another example of the not so benign neglect suffered by aviation maintenance in California. Although high level bureaucrats from both the state government and COCCC were invited, none chose to join the forum. Even the COCCC representative to the Partnership was not allowed to attend, even though the partnership is funded through the COCCC.

The absence of representation from Sacramento was probably the greatest indication of the need for policy actions. The question is what policy actions?

The magnitude of neglect is so great that it is highly unlikely that any policy change is feasible at this time. Thus, the forum agreed that the most important step the partnership can take at this time is to start a task force to increase awareness at virtually all levels of the government, the public, and the schools.

In the meantime, San Jose State University (SJSU) is faced with the question of whether to continue with its aviation program. It is an expensive program and the school administration is questioning why they should continue. It is the only university in California offering an aviation program. Thus, losing the program at SJSU would put a severe strain on the articulation of aviation maintenance in California.

The partnership strongly supports the continuation of the program at SJSU, but it is not clear what impact such support will have on the decision. Based on the level of neglect (of aviation maintenance) in the state officialdom, the budget constraint on the schools, and the fiscal emasculation of the partnership as a platform for showing support, the likelihood of losing the program at SJSU appears quite high.

Rather than a policy change, this forum recommended the formation of a task force to influence the legislators, as well as the schools and the general public. This recommendation was addressed by the next panel.

Panel C: Programs to Advance Aviation Maintenance

The Western Region of Aviation Technical Education Council (ATEC) has agreed to work with Partnership 2000 to advance the state of aviation maintenance in California

Representatives from the Western Region of the Aviation Technical Education Council (ATEC) suggested that the partnership join forces with ATEC to implement the recommendations. Because ATEC has to attend to the entire region rather than just California, ATEC cannot carry the campaign alone. However, by joining forces, the ATEC - P2000 alliance can become an effective force for advancing the cause of aviation maintenance in California. The participants in the forum agreed with the formation of the alliance.

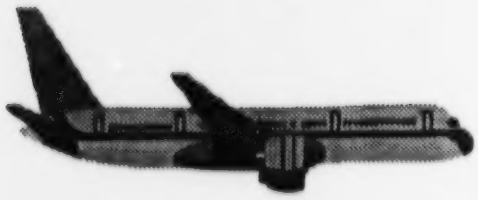
- Based on the current projections, it appears that the California school systems have a lead time of about three to five years. That is, the current lull in the need for aviation maintenance technicians will last for three to five more years. Subsequently, the demand will increase considerably. If planned properly, California can regain some of the lost jobs in aviation maintenance by rebuilding its training capability and the relevant business atmosphere during the lull.
- The recommended composition of the task force is as follows: Industry (4 representatives), FAA (1), California Department of Transportation (1), Education (4 representatives including K-12, community colleges, universities), and ATEC (2-3). Since Partnership 2000 has representations from all the groups, at least some of the representatives to the task force will also be from the partnership.
- Representatives of P2000 will attend the next semi-annual ATEC meeting in October to discuss the formation of the task force, the development of the strategic plan, and funding. Appropriate funding is an important consideration since the magnitude of the task is so large that it is unreasonable to expect any major change without constant attention for a period of time. This requires people, and people cost money. The combined resources of ATEC and P2000 should be able to locate appropriate sources of funds.
- The task force should develop a strategic plan to be presented to the state legislature, the Governor, and the Board of Governors for

The task force recognizes the need to make some dramatic changes in how the school systems operate in order to become a major contributor to advancing the state of aviation maintenance in California.

the California Community Colleges. The plan should include the data from both the ATEC study and the FAA study, and extrapolation from the data showing the economic value of the aviation maintenance jobs to California.

- The plan should include a major section on cost control to emphasize more education/training at lower cost. This part of the plan should include integration of instructional technology and other technological advances relevant to training such as distance learning and inexpensive simulation to substitute for expensive equipment in maintenance training.
- As an extension of the above, the task force should explore a joint venture between DoD, the airline industry, and the schools to develop a series of digital simulators and associated training programs using the simulators to both reduce the cost of training as well as expand the number of schools that can offer the training.
- The plan should include ways to help schools retain expensive aviation maintenance programs in the wake of severe budget cuts in education. Part of the answer is the cost control plan above, but the task force should explore other means of help such as seeking other sources of funding support, joint ventures with industry, fee for classes, and more sharing of resources by the schools.
- The plan should include integration of aviation maintenance training with other aspects of the school to work transition. This part of the plan should show the beneficial effects of aviation maintenance training on other technical subjects because of its emphasis on mathematics and basic technical subjects.
- The task force should explore the regionalization approach proposed by Vito Ciarfaglio as a way to meet the special needs of regions, as well as a way to improve the effectiveness of aviation maintenance programs. Regionalization has considerable merit if it helps students from impoverished communities gain entrance to the aviation maintenance industry. This requires developing feeder programs in high schools and community colleges in impoverished communities through distance learning and pc-based simulation programs.

- In parallel with the task force, the forum encourages faculty members of aviation maintenance programs to serve on faculty committees as part of an overall program to educate the rest of the campus. Similarly, the faculty members should educate their representatives to the legislation.
- The task force of ATEC and P2000 members should collaborate with the Technical Advisory Committee for Aeronautics (TACA) of the California Transportation Commission to plan their fall 1995 aeronautics forum.



Appendix

Resume and Agenda

Partnership 2000

Jack Fujimoto, Ph.D. Project Director
Los Angeles Mission College

Wellford "Buzz" Wilms, Ph.D.

Wellford "Buzz" Wilms is an associate professor in UCLA's Graduate Schools of Education where he is also chair-elect of the faculty. Dr. Wilms is also research director of the California Worksite Research Committee, a nonpartisan group of policy leaders from industry, labor, government and education.

For the past four years, Dr. Wilms' research team has been working as industrial anthropologists, studying how leading manufacturers - NUMMI (a GM-Toyota joint venture), USS-POSCO (a US Steel-POSCO joint venture), Douglas Aircraft, and Hewlett Packard - have adjusted to the changing environment. The results of the research are scheduled for publication by Random House in early 1995.

A second study is currently examining how best practices are diffused by these companies throughout the value chain and the implications for training policy. The research is financed by the California Employment Training Panel, the California Senate, and private sponsors including the Alfred P. Sloan Foundation.

Wilms serves on the advisory board of UCLA's Lewis Center for Public Policy and is an editor of the *International Journal of Educational Development.*

Leo C. Coleman, Ph.D.

Prior to becoming a full time management consultant, Dr. Coleman was director of human resources for one of the nation's largest independent banks. He also served as a Personnel Administrator and corporate director of training and development for a major "300" company.

He has 28 years experience in all phases of training and develop-

ment programs in government, business and industry, and was a professor in the California State University system.

Dr. Coleman has managed the training, education, and development functions for skills, supervisory, engineering and management personnel at twelve training facilities in the United States and overseas.

An active national committee member and former chapter executive vice president for the American Society for Training and Development, Dr. Coleman has also served as a member of numerous business and industry related training and education committees, including the United States Independent Telephone Association and Michigan State University Continuing Education Service.

Dr. Coleman has provided training and consulting services to local, state, national and international government, professional associations, and organizations such as United Nations, Warner-Lambert, American Airlines, Xerox, Frito-Lay, Taylor Made Golf, Standard Oil Company - AMOCO, Los Angeles Business Labor Council, and the governments of Trinidad, Jamaica, Barbados, Bahamas, and the Republic of China.

His academic credentials are BS in Business Education, Masters in Business Administration, and Ph.D. in Industrial Management.

He was awarded lifetime teaching credentials by the California State University system to teach business and industrial management.

Partnership 2000

Jack Fujimoto, Ph.D. Project Director
Los Angeles Mission College

Panel 1: The future of air transportation in California as viewed by industry.

Moderator: Jack Fujimoto, Ph.D. - Los Angeles Mission College
Facilitator: Marian Kelly
Panelists: Vito Ciarfaglio
Lou Gusto - United Airlines (SFOMH)
Steve Regulinski - United Airlines
Scott Vandenberg - Continental Airlines
David Wilson - The PMR Group

Panel 2: Policy Actions needed to move California in the Proper Direction.

Moderator: Jack Fujimoto, Ph.D. - Los Angeles Mission College
Facilitator: Marian Kelly
Panelists Don Clausen - Member of Congress (retired)
Michael Ego - San Jose State University
Don Nakamoto - AFL-CIO IAM

Panel 3: Commitments and programs needed to meet industry's needs.

Moderator: Vito Ciarfaglio
Facilitator: Marian Kelly
Panelists: Steve Adams - San Diego Miramar College
Don Brunet - Los Angeles Community Colleges (retired)
Paul Chlapecka - San Diego Miramar College
Bob Clifton - Orange Coast College
Berta Cuaron - San Diego Miramar College
Phil Cypret - Sacramento City College
Chuck Gifford - Cypress College
Lawrence Johnson - Chaffey College
Hoi Ko - San Francisco City College
Tom Reiger - Kings River College
George Rivas - UAL (Internship Program)
Douglas Treadway - Shasta College
John Shablow - San Diego Miramar College
Livio Martin - San Bernardino Valley College
Jim Weber - San Diego Miramar College
Craig Wilder - West Los Angeles College
Bruce Yoho - Long Beach City College

INTERN BRIEFING

Memo from Lou Gusto - United Airlines:

Here ia a brief re-cap of the recent internship that started on November 1, 1993 and ended on December 23, 1993.

Total number of Students: 24 (3 females, 12 minorities).

Schools Represented and number of students:

College of San Mateo	17
City College of San Francisco	4
San Jose State University	3

The following are some of the comments we have received from the students about the internship.

"I was really inspired by the seriousness and commitment shown to the internship program. It is something I will certainly promote to others."

"It was a great experience one which allowed us to see the operation in a personal manner, something school cannot teach."

"I was really satisfied with the work assignment, more so ever cause the projects were real problems and the results could be noted by mechanics as well as management."

"I feel my experience here at United Airlines has provided me with an edge over others who, like myself, want to become mechanics."

"It has been a great learning experience and I would recommend it to anyone considering a career in the airline industry."

"My experience with United has been a good one, the computer skills and overall maintenance procedures has made me a good candidate with any airline."

"In my opinion, it was a great experience, and the program was perfect, and I would love to do it again."

"I found my work assignment educational, interesting and it will help me for my next class."

"The overall internship program was excellent. It is the best opportunity a person can have."

"The internship program was the best learning experience of my life and I learned a vast amount of vital information about United Airlines."

"I think I got as much out of it as I possibly could have. I certainly got more from it than I expected."

MECHANIC EMPLOYMENT

AVIATION TECHNICIAN INTERN SAMPLE OF PROJECTS
WINTER 1993

(11/1/93 - 12/23/93)

AIRFRAME MAINTENANCE

1. Provide fundamental requirements of working in a team environment with an emphasis on Best Maintenance philosophy. Heavy exposure to production activities to include assisting and supporting the tooling control center and process improvement departments.

2. Introduction to Airframe Maintenance as experienced by a foreman. Experience would include managing Aircraft Maintenance from light to heavy visits, work with mechanics, leads and inspectors. Some supervised technical decisions will be made, order parts, brief employees, write reports, set expectations and follow-up.

3. Opportunity provided to become familiar with various functions within the MOD which would include an overview, B29 operations, Parts Availability and Material Distribution, general familiarization course, line orientation, tool management, Labor Relations and general foreman responsibilities.

4. Opportunity provided to compare the roles and responsibilities of a mechanic to those of management. Also define the difference between the lead mechanic relative to the mechanic and foreman.

COMPONENT MAINTENANCE

1. Support Component Maintenance by participating in problem solving work unit teams, interfacing with vendors and Product Engineers on development programs and maintaining and updating seat configuration control documentation (e.g., assembly drawings, IPC, CMM, etc.).

2. Assist and monitor manufacturers with requested rework, setup reworked covers accepted by product engineers in stock under controlled part numbers and provide guidelines for

disqualification of purchased covers after rework. Also interfaced with work unit teams to streamline objective to achieve desired and implementable tasks.

ENGINEERING

1. Provide the intern with maximum exposure to the airline by allowing the individual to interface with areas outside of the immediate department. In addition the intern will also be responsible for CATIA training, auto cad, updating wiring diagrams via Quantas Aircraft, revising wiring diagrams and mark-ups by drafting.

2. Responsibilities include monitoring aircraft interior systems maintenance reliability and provide troubleshooting support as required to meet 757 and 767 Fleet MSR goals.

3. Research and develop a Maintenance Manual for the new color scheme which would include all the airline fleet.

ENGINE MAINTENANCE

1. Assist with the many aspects of the 737-322/522 APS2000 Auxiliary Power Unit (APU) to support the activity performed by Technical Services. Responsibilities include assisting with the daily monitoring and resolution of 737-322/522 fleet problems (deferred items, delay and cancellations), as well as project oriented assignments (engine configuration improvements programs and component processing improvements.

2. Research the most common mode of failure for the engine indication on the DC10 fleet and to present options to correct the problems.

3. Review United and Boeing parts configuration with actual parts on aircraft and make corrections of deviations for Chapter 78 Thrust Reverser Modifications.

4. Opportunity provided to manage a service evaluation of alternate hardface coatings for the ST8D fan blade midspan shrouds.

5. Responsibilities included attending emergency response meeting, helping to set up spill response carts, completing inventory for trucks, investigating past chemical related incidents and completed assignments on the computer for follow-up usage by UAL employees.

6. Assist in the making of 7 boards to be posted in the Plate Shop which will identify evacuation routes, chemicals stored in various areas and guidelines to follow for spill response and clean up.

MOC II

1. Analyze the work processes, determine proper and effective tooling and equipment to support the process, prepare specification for tooling and equipment, and also initiate orders for tooling and equipment. Opportunity also provided to gain a working knowledge of the computer hardware and software required to accomplish the various tasks.

INVENTORY MANAGEMENT

1. Research computer programs that will help automate the database management required for pooling. The interns would also have the responsibility of investigating two carriers that have existing programs which automated their pooling desks and recommend whether UA should acquire their existing programs or design our own.

LINE MAINTENANCE

1. Assist in developing computer databases and reports for aircraft maintenance reliability, attendance dependability, COA Package implementation and tracking and developing a training matrix for new line mechanics.

2. Assist in the planning and execution of aircraft damage repairs, troubleshooting of chronic and non-routine problems with aircraft mechanical and electronic control and monitoring systems. Opportunity also provided to participate in the planning, design and construction/acquisition of test equipment which is used to improve troubleshooting techniques and procedures. The intern will be trained for and expected to develop a working knowledge of the paper procedures used in the operation of the line technical services group.

TRAINING

1. Responsibility provided for overviewing State and Federal Hazard communications standards, interpreting DOT and NFPA container labeling requirements, effects of toxicology chemicals on the body (acute and chronic), UAL Hazard Communications Standards and Hazard Material emergency procedures.

2. Opportunity to participate in the final stages of corporate training and preparedness to ensure the successful introduction of the Airbus A320 fleet type. The responsibilities will also include the coordination of Airbus A320 pre-inaugural training and operations activities.